

REMARKS

By this amendment, Applicant has amended claims 1 and 2 to delete the limitation that the separation column is a silica gel/C8 separation column. This limitation has now been recited in new dependent claims 15 and 16.

Claim 1 stands rejected under 35 U.S.C. 102(b) as allegedly being anticipated by the Li et al. article. Claims 3, 4 and 9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. Applicant again traverses these rejections and requests reconsideration thereof, at least insofar as the rejections are relevant to the amended claims.

The rejected claims relate to an apparatus for analyzing nitropolycyclic aromatic hydrocarbons. The apparatus an auto-sampler to which a methanol water mixture and a sample comprising nitropolycyclic aromatic hydrocarbons are sent; a separation column downstream of the auto-sampler for receiving the methanol water mixture and the sample from the auto-sampler and separating the sample containing nitropolycyclic aromatic hydrocarbons into at least four separate nitropolycyclic aromatic hydrocarbons including 1-nitropyrene, 1,3-dinitropyrene, 1,6-dinitropyrene and 1,8-dinitropyrene; a reduction column downstream of the separation column for receiving the at least four separate nitropolycyclic aromatic hydrocarbons including 1-nitropyrene, 1,3-dinitropyrene, 1,6-dinitropyrene and 1,8-dinitropyrene from the separation column and aminating the separated nitropolycyclic aromatic hydrocarbons; and a fluoresce detector. The apparatus can also include an analysis column for separating an interfering component contained in the sample from the aminated separated nitropolycyclic aromatic hydrocarbons

(see, claim 2).

The Li et al. articles disclose that the determination of mono- and di-nitro polycyclic aromatic hydrocarbons (PAHs) was accomplished by on-line reduction to the corresponding amino PAHs, which were then separated and detected using high-performance liquid chromatography (HPLC) and chemiluminescence detection. On page 179 of this article, chromatograms are shown in which 2(A) is a chromatogram of a standard mixture. Peaks: 1 = 1,8- dinitropyrene, 2 = 2-nitroanthracene, 3 = 1-nitropyrene, 4 = 6-nitrochrysene, 5 = 3-nitroperylene and 6 = 1-nitroperylene, (B) and (C) are chromatograms of a diesel particulate extract from fractions containing mono-nitro PAHs and di-nitro PAHs, respectively, and (D) and (E) are chromatograms of a diesel exhaust emission filter extract sample from fractions containing mono-nitro PAHs and di-nitro PAHs, respectively.

While the introduction of Li et al. mentions that “great attention has been directed to 1-nitropyrene and 1, 3-, 1, 6- and 1,8-dinitropyrenes,” it does not appear that the Li et al. article discloses a separation column for separating a sample comprising nitropolycyclic aromatic hydrocarbons into at least four separate components including 1-nitropyrene, 1,3-dinitropyrene, 1,6-dinitropyrene and 1,8-dinitropyrene. Rather, in Li et al, the nitro PAHs are first reduced to amino PAHs using a catalyst column (see, the section 2.3 bridging pages 178 and 179 of Li et al). It is the amino PAHs that are separated by chromatographic separation (see, section 2.4 on page 179 of Li et al). Accordingly, the Li et al. article does not disclose and would not have rendered obvious the presently claimed invention including a separation

column for separating a sample containing nitropolycyclic aromatic hydrocarbons into at least four separate nitropolycyclic aromatic hydrocarbons including 1-nitropyrene, 1,3-dinitropyrene, 1,6-dinitropyrene and 1,8-dinitropyrene.

Moreover, the separation column in Li et al. is not disclosed to be a silica gel/C8 separation column, as now recited in new claims 15 and 16.

The present invention also includes an auto-sampler to which a methanol water mixture and the sample comprising nitropolycyclic aromatic hydrocarbons are sent. The separation column receives the methanol water mixture and the sample from the auto-sampler. On the other hand, in Li et al., the methanol water mixture and the sample are sent first to the catalyst column. It is disclosed that “[b]ecause the methanol-water solution is not appropriate to the chemiluminescence detection system, it is necessary to change to an acetonitrile-buffer solution as mobile phase by using a switch valve.” The chromatographic separation of the amino compounds is then carried out in Li et al. using the acetonitrile-buffer solution; the chromatographic separation column does receive the sample and methanol water mixture from an auto-sampler.

Moreover, according to the present invention, the reduction column for aminating the separated nitropolycyclic aromatic hydrocarbon is downstream of the separation column. The opposite is true in Li et al. On-line reduction using a catalyst column is first carried out and then chromatographic separation is carried out downstream of the catalyst column.

For the foregoing reasons, the apparatus of the present invention is

clearly not disclosed and would not have been obvious from Li et al.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all the claims now in the application are requested.

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Respectfully submitted,

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